

# PATENT SPECIFICATION



Application Date: Nov. 19, 1926. No. 29,272/26.

281,860

Complete Left: Aug. 19, 1927.

Complete Accepted: Dec. 15, 1927.

## PROVISIONAL SPECIFICATION.

### Improvements in and relating to Commutators for Dynamo Electric Machines and Methods of Manufacturing the same.

We, THE BRITISH THOMSON-HOUSTON COMPANY LIMITED, a British company, having its registered office at Crown House, Aldwych, W.C. 2, and ALEC GEORGE HENTON, a British subject, of 59, Hastings Road, Stoke, Coventry, in the County of Warwick, do hereby declare the nature of this invention to be as follows:—

- 10 This invention relates to the manufacture of commutators for dynamo electric machines and has for its object the production of a commutator which is cheap to manufacture and efficient in  
15 operation. To this end this invention consists in forming the segments of the commutator of sheet copper, from which they are stamped to the required shape after which the segments are bent by  
20 means of a special tool, the segments being then arranged in their relative positions in a suitable mould and united so as to form a complete commutator by means of an insulating material capable  
25 of being moulded such as a synthetic resin.

- The accompanying drawings serve to illustrate this invention, Fig. 1 being a plan view of a commutator segment  
30 stamped out of sheet metal. Fig. 2 is a perspective view of the same after having been bent to shape, and Fig. 3 is an end view of part of a commutator built up according to this invention.

- 35 Referring to the drawings, the segments consist of stampings having a substantially rectangular working surface 1. On each side of this working surface are dove-tail shaped projections 2. On  
40 one end is a lug 3 shaped as illustrated. The stamping is then put in a press and bent as clearly shown in Fig. 2, the pro-

jections 2 being bent downwards and the lug 3 upwards, the working surface being given a curved contour at the same 45 time. These shaped segments are then placed in a cylindrical mould, and may be conveniently held in their relative positions by means of the lugs 3. A central bushing 4 may be provided so 50 that the completed commutator may be secured to the machine shaft. When the segments and bush are in place the mould is filled with a synthetic resin mixed with a suitable filler, and the 55 whole subjected to heat and pressure so that the resin is polymerised and becomes solid and insoluble, binding the segments in their relative positions.

The lugs 3 which project from the 60 finished commutator are utilised for electrically connecting the segment to the armature winding. In cases where the machine is connected to a circuit of fairly high voltage it may be desirable 65 to provide further insulation between the segments, and this may be effected by inserting sheets of mica between the segments before the insertion of the resin in the mould. 70

The above method of constructing a commutator is economical in the use of copper and practically eliminates machining thereby reducing the cost of manufacture. The segments are firmly 75 held in their places by the moulding compound and the risk of bursting at high speeds is reduced to a minimum owing to the large amount of moulding compound employed. 80

Dated this 16th day of November, 1926.

JOHN GRAY,  
Crown House, Aldwych, London, W.C. 2,  
Agent for the Applicants.

AMENDMENT - SEE LAST PAGE

## COMPLETE SPECIFICATION.

# Improvements in and relating to Commutators for Dynamo Electric Machines and Methods of Manufacturing the same.

We, THE BRITISH THOMSON-HOUSTON COMPANY LIMITED, a British company, having its registered office at Crown House, Aldwych, London, W.C. 2, and ALEC GEORGE HENTON, a British subject, of 59, Hastings Road, Stoke, Coventry, in the County of Warwick, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the manufacture of commutators for dynamo electric machines and has for its object the production of an axial commutator which is cheap to manufacture and efficient in operation. To this end this invention consists in forming the segments of the commutator of sheet copper, from which they are stamped to the required shape after which the segments are bent by means of a special tool, the segments being then arranged in their relative positions in a suitable mould and united so as to form a complete commutator by means of an insulating material capable of being moulded such as a synthetic resin.

The drawings left with the Provisional Specification serve to illustrate this invention, Fig. 1 being a plan view of a commutator segment stamped out of sheet metal. Fig. 2 is a perspective view of the same after having been bent to shape, and Fig. 3 is an end view of part of a commutator built up according to this invention.

Referring to the drawings, the segments consist of stampings having a substantially rectangular working surface 1. On each side of this working surface are dove-tail shaped projections 2. On one end is a lug 3 shaped as illustrated. The stamping is then put in a press and bent as clearly shown in Fig. 2, the projections 2 being bent downwards and the lug 3 upwards, the working surface being given a curved contour at the same time. These shaped segments are then placed in a cylindrical mould, and may be conveniently held in their relative positions by means of the lugs 3. A central bushing 4 may be provided so that the completed commutator may be secured to the machine shaft. When the segments and bush are in place the

mould is filled with a synthetic resin mixed with a suitable filler, and the whole subjected to heat and pressure so that the resin is polymerised and becomes solid and insoluble, binding the segments in their relative positions.

The lugs 3 which project from the finished commutator are utilised for electrically connecting the segment to the armature winding. In these cases where the machine is connected to a circuit of fairly high voltage it may be desirable to provide further insulation between the segments, and this may be effected by inserting sheets of mica between the segments before the insertion of the resin in the mould.

The above method of constructing a commutator is economical in the use of copper and practically eliminates machining thereby reducing the cost of manufacture. The segments are firmly held in their places by the moulding compound and the risk of bursting at high speeds is reduced to a minimum owing to the large amount of moulding compound employed.

We are aware of Specification No. 256,045 and do not claim anything described or claimed therein.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An axial commutator for a dynamo electric machine, formed by stamping the segments from sheet copper, bending them to the required shape, assembling the shaped segments in a mould and uniting them by moulded insulating material to form the complete commutator.

2. A commutator for a dynamo electric machine, formed by stamping the segments from sheet copper, each stamping comprising a substantially rectangular working surface portion and a dove-tail projection at each side, bending each stamping so that the working surface portion is given a curved contour and the projections are substantially perpendicular thereto, placing the shaped segments in a mould in their proper relative positions, and uniting them by moulded insulating material to form the commutator.

3. A commutator for a dynamo electric

machine, formed by stamping the segments from sheet copper, each stamping comprising a substantially rectangular working surface portion, a dove-tail projection at each side, and a lug at one end, bending each stamping so that the working surface portion is given a curved contour, the projections substantially perpendicular to the concave face of the working surface portion, and the lug substantially perpendicular to the convex face of the working surface portion, placing the shaped segments in a mould

in their correct relative positions, and uniting them by moulded insulating material to form the commutator. 15

4. A commutator for a dynamo electric machine, formed substantially as described.

4. A commutator for a dynamo electric machine, formed substantially as described with reference to the drawings. 20

Dated this 4th day of August, 1927.

JOHN GRAY,

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Agent for the Applicants.

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### ERRATUM.

SPECIFICATION No. 281,860.

Page 3, *delete* lines 17 and 18

PATENT OFFICE,

November 6th, 1930.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

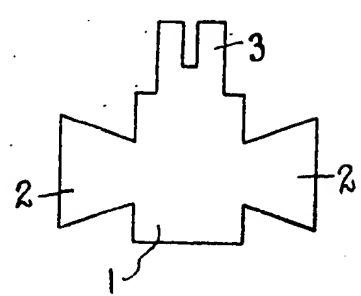


Fig. 3.

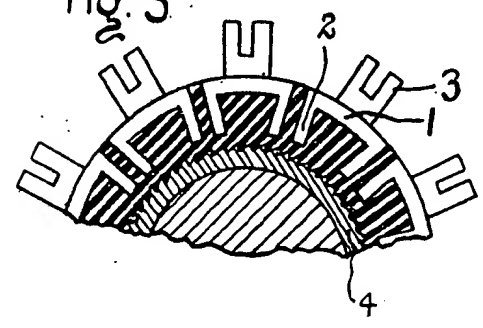


Fig. 2.

